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EXAMINER

HANNON, THOMAS R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 10, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al (6,273,612) in view of Okamoto et al. (6,089,755).

Ono discloses a journal bearing system comprising a bushing (10) and a journal pin (not shown) within the bushing and rotatable relative to the bushing about a longitudinal axis. The bushing and journal pin have an engagement surface with an engagement length comprising a substrate material (12) and a solid lubricant (in layer 16). The layer 16 is shown to vary the concentration of the solid lubricant along the engagement length, with the concentration being highest at the point of highest load. Moreover, Ono discloses that the concentration variation of the solid lubricant is equivalent to varying the thickness of the overlay layer with a constant concentration. That is, a portion of the bearing journal that has the highest load can have an overlay with a large thickness, or equivalently a large concentration of the solid lubricant.

Okamoto discloses a journal bearing in which the thickness of the overlay varies along the longitudinal length of the bushing to accommodate the high loads at the ends thereof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Ono in other known bearing systems, notably that of Okamoto, to result in an overlay having a concentration which varies in the longitudinal direction to accommodate the high loads at the ends of the longitudinal direction. With respect to claim 3, the value of the maximum concentration would have been obvious to one of ordinary skill in the art at the time

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the invention was made subject to the desired parameters. With respect to claim 4, the base material (1'6) comprises a coating applied to a substrate (12). With respect to claims 5 and 26, the substrate 12 of Ono is a copper alloy and the solid lubricant comprises molybdenum disulphide (column 8, line 56). With respect to claim 10, the resultant structure of the above combination corresponds to the structure defined by the means plus function limitation.

Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al. in view of Okamoto et al. as applied to claims 5 and 10 above, and further in view of Andler.

Andler discloses a journal bearing system in which a bushing has an engagement surface comprising a concentration of solid lubricant within a copper matrix, the solid lubricant being lead. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the solid lubricant and its matrix of Ono to consist of other known solid lubricant matrix overlays, including that of lead in a copper matrix, because this is taught and suggested by Andler, as being a known overlay composition for journal bearings.

Claims 9, 15-18, and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono et al. in view of Okamoto et al. as applied to claims 1-5 and 10 above, and further in view of McCreary.

McCreary discloses a bushing and journal pin assembly for a geared turbofan transmission in which the journal pin has at least one lubrication passageway (60) extending to the engagement surface. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the bushing assembly of Ono in other known devices including that of a turbofan transmission, because McCreary discloses the use of a bushing obtained by plating. Moreover, it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to provide a journal pin with lubrication passageways, as the pin for Ono, because this is taught and suggested by McCreary as being a known manner of lubricating a bushing assembly. With respect to claim 25, the transmission of McCreary is liquid-lubricated, the combination inherently providing the function claimed.

Claims 7, 8, 19, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Applicant's arguments filed March 6, 2007 have been fully considered but they are not persuasive. Applicant states that in Ono "a circumferentially varying lubricant concentration of a solid lubricant in a resin (col. 8, line 59-col. 9, line 13) thus, contrary to the representation in the Office action that the layer varies in 'concentration of the solid lubricant along the engagement length...', the concentration is constant along the engagement length but varies circumferentially." It is respectfully submitted, that the Office Action has not characterized Ono as describing a concentration of the solid lubricant that varies longitudinally along the engagement length, i.e. along surface parallel to the axial direction. The engagement length described by Ono is indeed in the circumferential direction. Ono discloses two equivalents to accommodate the high loading, one being to vary the thickness of the overlay, and the other to vary the concentration of the solid lubricant in the overlay. Applicant states "there is no citation

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for the alleged assertion of equivalence between concentration and thickness.” However, Ono is the citation for such equivalence.

With respect to Okamoto, Applicant states “Okamoto et al. does not suggest modifications to address operation after a lubricant loss in a geared turbodfan transmission.” It is respectfully noted, that Okamoto is not relied upon for such a teaching. Applicant further states “the page 2 assertion to modify Okamoto et al. “... to accommodate the highloads at the ends of the longitudinal direction” is circular logic and without support”. However, the rejection does not suppose to modify Okamoto, but to modify Ono in view of Okamoto. The combined teachings of Ono and Okamoto result in a bearing in which the concentration varies along the longitudinal extent.

Applicant states “there appears to be an a la carte mixing of embodiments in citing Ono et al elements.” This is not understood. Each claim limitation as presented has been specifically noted as being present in the features of Ono. New claim 26 does not distinguish from Ono, as a base material of Ono is a coating applied to a substrate, the base material is a copper based material, and the solid lubricant is molybdenum disulphide. New claim 27 does not distinguish from claim 1, as the scope of the claim corresponds to the base material being the resin with the solid lubricant within a matrix of the resin.

With respect to the rejections based on Andler and McCreary, Applicant asserts the combinations are based on improper hindsight. It is respectfully noted, that the rejections as presented are proper with the combinations presented being obvious to one of ordinary skill in the art at the time the invention was made based on the combined teachings of the known prior art.

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**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Hannon whose telephone number is (571) 272-7104. The examiner can normally be reached on Monday-Thursday (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Thomas R. Hannon  
Primary Examiner  
Art Unit 3682

trh